WHAT IS CLAIMED IS:

1. An integrated sprocket and housing which is used in a variable valve timing mechanism, the integrated sprocket and housing including:

a sprocket portion which is formed in a substantially annular shape, and which has teeth on the outer circumference thereof; and

a housing portion which is formed integrally with the sprocket portion as a sintered body made of a ferrous powder material so as to be disposed inside the sprocket portion, and which has recesses extending from an inner circumference of the housing portion, wherein

the entire surfaces of the sprocket portion and the housing portion are covered with a steam oxidized layer which is formed by a steam treatment, and a nitrided layer which is formed by a gas soft nitriding treatment subsequent to the steam treatment.

2. An integrated sprocket and housing according to claim 1, wherein the teeth of the sprocket portion are covered with a hardened layer which is formed by a high-frequency induction hardening process in which the teeth are heated to a temperature exceeding the transition point of the ferrous powder material.

3. An integrated sprocket and housing according to claim 1, wherein the steam oxidized layer is covered by the nitrided layer.

4. An integrated sprocket and housing according to claim 1, wherein the thickness of the steam oxidized layer is in a range from 3 to 8 μm.

5. An integrated sprocket and housing according to claim 1, wherein the thickness of the nitrided layer is in a range from 2 to 5 μm.

6. An integrated sprocket and housing according to claim 1, wherein the nitrided layer is made thinner than the steam oxidized layer.

7. An integrated sprocket and housing including:

a sprocket portion which is formed in a substantially annular shape, and which has teeth on the outer circumference thereof; and

a housing portion which is formed integrally with the sprocket portion as a sintered body made of a ferrous powder material so as to be disposed inside the sprocket portion, and which has recesses extending from an inner circumference of the housing portion,

wherein each of the recesses includes an arc-shaped slide surface which is located backside of the teeth, and which allows another element to slide along, and

wherein the entire surfaces of the sprocket portion and the housing portion are covered with a steam oxidized layer which is formed by a steam treatment, and a nitrided layer which is formed by a gas soft nitriding treatment subsequent to the steam treatment.

8. A method for manufacturing an integrated sprocket and housing including the steps of:

forming a green compact of a ferrous powder material including a sprocket portion having teeth on the outer circumference thereof, and a housing portion which is disposed inside the sprocket portion, and which has recesses extending from an inner circumference of the housing portion;

sintering the green compact to obtain a sintered body;

subjecting the sintered body to a steam treatment in which a super-heated steam is used;

subjecting the sintered body to a gas soft nitriding treatment in which an ammonium gas is used; and

subjecting the teeth to a high-frequency induction hardening treatment.

9. A method according to claim 8, wherein the conditions of the high-frequency induction hardening treatment are determined so that the teeth are heated to a temperature exceeding the transition point of the ferrous powder material.

10. A method according to claim 8, wherein the temperature of the super-heated steam is set in a range from 550°C to 600°C.